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(54) A device for aesthetic skin treatment

(57) A device for the aesthetic treatment of the skin and which essentially comprises a pulse generator (1), of which the positive and negative outputs (2, 3) are each connected to a plurality of fine solid skin penetrating needles (5) which are fitted to the ends of respective flexible connecting wires (4). The device is applicable in particular to the treatment of the wrinkles of the skin of an individual. The needles are inserted into individual sockets (12) inside insulating shrouds (9).

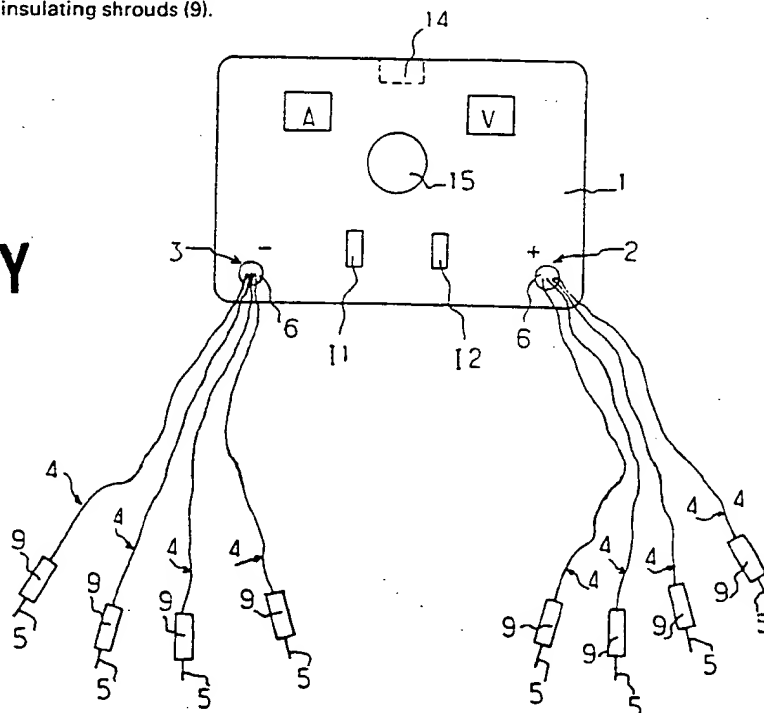
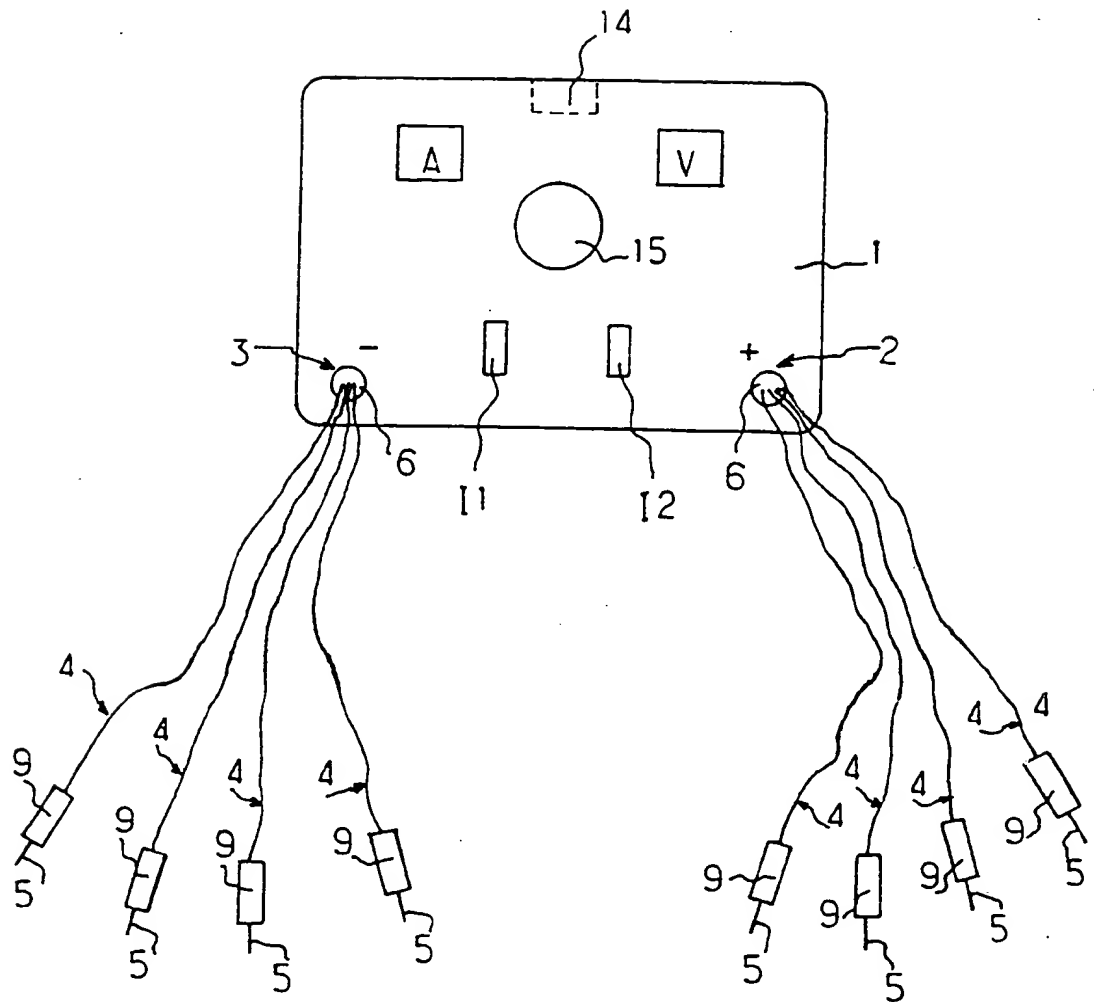
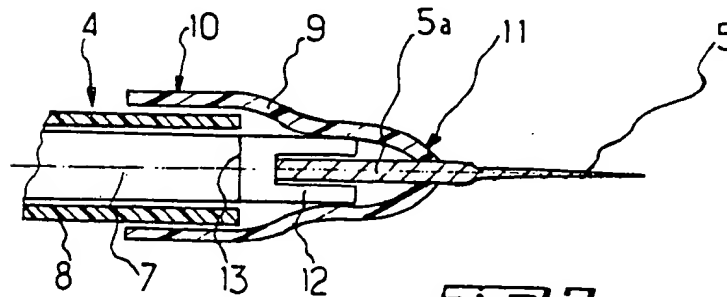


FIG. 1

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**FIG. 1****FIG. 2**

SPECIFICATION

Improvements in or relating to device for aesthetic skin treatment

5 The present invention relates essentially to a device for the aesthetic treatment of the skin.

There have already been proposed various means for treating or rejuvenating the skin which makes it possible to smooth out wrinkles, lines or the like appearing on the human body and in particular on the face from a certain age.

10 It is thus already known to rejuvenate the skin of the face by means of cosmetic products or also with the assistance of mechanical means such as for instance as abrasive means or also discs or electrodes which are applied to the skin to provide a weak electric shock acting upon the muscles and tending to remove the wrinkles or the lines from the epiderm.

15 These various means do not however make possible a final removal of the wrinkles which would necessarily reappear more or less shortly after the treatment. Moreover, these means do not allow to treat several zones of the epiderm at the same time and are generally coming short of achieving the effectiveness and all the treatment possibilities sought.

20 For that purpose, the invention is directed to a device for the aesthetic treatment of the skin and belonging to the kind comprising a pulse generator the positive output of which is connected to a means likely to enter the skin for treating same and the negative output of which is connected to a means forming a current-return electrode, characterized in that both aforesaid means consist each one of a plurality of solid needles associated with the end of an electrically conducting flexible wire and adapted all of them to penetrate into the skin to be treated.

25 According to a preferred embodiment of this device, a like number of solid needles is connected to the positive output of the generator and to its negative output.

30 According to a further characterizing feature of the invention, each solid needle is in electric contact through its heel with the end of the metal conductor forming the core of said flexible wire.

35 According to a preferred embodiment, the heel of each solid needle is inserted into a small socket or the like rigidly connecting through welding or crimping for instance to the end of said conductor.

40 The device according to the invention is further characterized by a flexible, heat-formable sheath or casing surrounding the end of the flexible wire as well as the heel of the needle so as to connect the latter to the flexible wire.

45 It should be pointed out here that the aforesaid solid needles are supplied with electric current through the agency of a time-delay appliance providing for the self-acting switching out and on of the electric current with a predetermined frequency.

50 This time-delay appliance is advantageously integrated into the generator which also comprises a system for the manual or automatic variation of the frequency of the electric current flowing through the needles.

65 The number of needles connected to each output of the generator may be comprised between 2 and about 30 whereby in the latter case, it is possible to treat a substantial number of zones of the epiderm at the same time.

70 The invention will be better understood and further objects, characterizing features, details and advantages thereof will appear more clearly as the following explanatory description proceeds with reference to the accompanying diagrammatic drawings given by way of non-limiting example only illustrating a presently preferred specific embodiment of the invention and wherein:

75 Figure 1 is a diagrammatic view of a device or contrivance according to the principles of the invention, and

80 Figure 2 is a view on a large scale and in axial section of the end of a flexible wire fitted with a needle.

85 According to an exemplary embodiment and with reference to the accompanying drawings, a device according to the invention essentially comprises a pulse generator 1 which comprises a positive output 2 and a negative output 3, each output being connected to a plurality of flexible wires or leads 4, the ends of which carry a very fine needle 5.

90 The flexible leads or wires 4 may be connected to the positive and negative outputs 2 and 3 permanently in an unremovable manner or through the medium of a plug or pin 6.

95 The number of wires or leads 4, hence of needles 5, at each output is equal to 4 according to the exemplary embodiment shown, but this number could be comprised between 2 and 30 without leaving the scope of the invention. There should preferably be provided a like a number of wires and needles at each one of the positive and negative outputs 2 and 3.

100 As better seen on Figure 2, each needle 5 is solid and in electric contact through its heel 5a with the end of the metal conductor 7 forming the core of the flexible wire or lead 4 which, as known per se, comprises a flexible sheath 8. A heat-formable flexible sleeve 9 is mounted onto the end of the flexible wire 4 as is seen at 10 as well as on the heel 5a of the needle 5 as is seen at 11, so as to connect the needle 5 to the flexible wire 4.

105 According to the exemplary embodiment shown, the heel 5a of each needle 5 is inserted into a small socket or the like 12 which is rigidly connected at by welding or setting with the end of the conductor 7, as diagrammatically shown at 13.

110 It could quite be possible without being outside of the scope of the invention to make an electric contact between the needle and the conductor without using a socket such as 12, for instance by merely bringing the heel 5a of the needle 5 in engagement with the end of the conductor 7, such a contact being reliable in view of the clamping achieved by the sleeve 9.

115 The needles 5 are fed with electric current through the agency of a time-delay appliance integrated into the generator 1 and diagrammatically shown at 14. This time-delay appliance would provide for automatically switching the electric current out an

on with a predetermined frequency defined by time intervals ranging for instance from a quarter of a second to a few seconds.

5 The generator 1 is fitted with an ammeter A and a voltmeter V as well as with a master switch I₁ for supplying the generator 1 from the electric network or for disconnecting same therefrom. A switch I₂ is also provided for breaking the electric current
10 flowing through the wires 4 and their associated needles. There has at last been diagrammatically shown at 15 a control means for manually or automatically varying the frequency of the electric current flowing through the needles.

15 The operation of the apparatus just disclosed will now be briefly described.

The fine solid needles 5 connected to the positive output 2 of the generator are inserted directly below and in substantially parallel relation to the wrinkles or lines to be treated. The needles 5 connected to
20 the negative output 3 and forming return electrodes are also inserted directly underneath the skin in suitable areas in accordance with the positions of the needles 5 connected to the positive output 2. It should be pointed out that the needles 5 connected to the negative output 3 of the generator 1 may
25 advantageously be inserted also into the wrinkles or lines of the skin.

Then an electric current, the frequency of which may for instance be about 100 Hz and the intensity
30 of which is of the order of a few micro-amperes for each needle, is passed through the needles 5. Thus, owing to the time-delay appliance 14, automatic current pulses will pass through the needles and the treatment may be carried out within a period of time
35 ranging for instance from 2 to 4 minutes in accordance with the extent or size of the wrinkles or lines to be treated. In this respect, it should be pointed out that with the device of the invention, it is possible in a first step to treat all the wrinkles of
40 substantially the same extent or size and then to treat in a second stage all the wrinkles or less extent or size.

The invention has accordingly provided a device for treating the skin which may be referred to as
45 being universal for treating all the skin surface defects and also for treating cellulitis.

Moreover, the distribution of the electric current
50 between all the needles which are equal in number to the positive and negative outputs of the generator, allows to perform a balanced treatment of the processed areas and to smooth out the wrinkles in a particularly effective and lasting way.

The invention is not at all limited to the embodiment described and shown, which has been

55 given by way of example only.

The invention covers all the technical equivalents of the means described, as well as their combinations if same are carried out according to its gist, and within the scope of the appended claims.

60 CLAIMS

1. A device for the aesthetic treatment of the skin and of the kind comprising a pulse generator, the positive output of which is connected to a means adapted to penetrate into the skin for treating same
65 and the negative output of which is connected to a means forming a current return electrode, characterized in that both aforesaid means consist eaach one of a plurality of solid needles associated with the end of an electrically conducting flexible wire, and adapted to penetrate into the skin to be
70 treated.

2. A device according to claim 1, characterized in that the positive output and the negative output of the generator are connected to a like number of
75 solid needles.

3. A device according to claim 1 or 2, characterized in that each solid needle is in electric contact through its heel with the end of the metal conductor forming the core of said flexible wire.

80 4. A device according to any one of the foregoing claims, characterized in that the heel of each solid needle is inserted into a small socket or the like connected as by welding or crimping to the end of said conductor.

85 5. A device according to any one of the foregoing claims, characterized by a heat-formable flexible sleeve surrounding the end of said flexible wire as well as the heel of the needle of connecting the latter to the flexible wire.

90 6. A device according to any one of the foregoing claims, characterized in that the solid needles are supplied with electric current through the agency of a time-delay appliance for automatically switching the electric current out and on with a predetermined
95 frequency.

7. A device according to claim 6, characterized in that said time-delay appliance is integrated into the generator which comprises a system for manually or automatically varying the frequency of the electric current flowing through the needles.

100 8. A device according to any one of the foregoing claims, characterized in that the number of needles connected to each output of said generator ranges from 2 to about 30.

105 9. A device substantially as described herein with reference to and as shown in the accompanying drawings.

on with a predetermined frequency defined by time intervals ranging for instance from a quarter of a second to a few seconds.

5 The generator 1 is fitted with an ammeter A and a voltmeter V as well as with a master switch I₁ for supplying the generator 1 from the electric network or for disconnecting same therefrom. A switch I₂ is also provided for breaking the electric current
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Then an electric current, the frequency of which may for instance be about 100 Hz and the intensity
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Moreover, the distribution of the electric current between all the needles which are equal in number
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3. A device according to claim 1 or 2, characterized in that each solid needle is in electric contact through its heel with the end of the metal conductor forming the core of said flexible wire.

80 4. A device according to any one of the foregoing claims, characterized in that the heel of each solid needle is inserted into a small socket or the like connected as by welding or crimping to the end of said conductor.

85 5. A device according to any one of the foregoing claims, characterized by a heat-formable flexible sleeve surrounding the end of said flexible wire as well as the heel of the needle of connecting the latter to the flexible wire.

90 6. A device according to any one of the foregoing claims, characterized in that the solid needles are supplied with electric current through the agency of a time-delay appliance for automatically switching the electric current out and on with a predetermined
95 frequency.

7. A device according to claim 6, characterized in that said time-delay appliance is integrated into the generator which comprises a system for manually or automatically varying the frequency of the
100 electric current flowing through the needles.

8. A device according to any one of the foregoing claims, characterized in that the number of needles connected to each output of said generator ranges from 2 to about 30.

105 9. A device substantially as described herein with reference to and as shown in the accompanying drawings.

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